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Claims

The invention claimed is:

1. A surgical targeting system 1 for adding an indicia image 2 to a radiographic image of a body 3 resulting from passage of image radiation through the body 4, said targeting system 1 comprising:
5 an antimicrobial drape 9 having an inner surface 11 of sufficient flexibility to conform to at least a portion of an outer surface 6 of the body 4, said drape 9 being puncturable to provide access to the outer surface 6 of the body 4, said drape 9 being transparent to the imaging radiation;
10 an indicia 21 affixed to a portion of said drape 9, said indicia 21 being opaque to the imaging radiation resulting in the indicia image 2 corresponding to said indicia 21; and
a means for fixing said indicia 21 relative to the outer surface 6 of the body 4 such that said indicia 21 provides a reference on the body 4 for correlating portions of the body 4 to the radiographic body image 3.
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2. The surgical targeting system 1 of claim 1 wherein said drape 9 comprises plastic impregnated with iodophor.
- 20 3. The surgical targeting system 1 of claim 1 wherein said indicia 21 comprises coordinates which are rectilinear and orthogonal.
4. The surgical targeting system 189 of claim 1 wherein said indicia 214 comprises polar coordinates.
- 25 5. The surgical targeting system 1 of claim 1 wherein said fixing means comprises adhesive 24 applied to said inner surface 11 of said drape 9.

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6. The surgical targeting system 1 of claim 5 wherein said adhesive 24 is applied continuously to the entire inner surface 11 of said drape 9.
7. The surgical targeting system 156 of claim 1 wherein said drape 164 comprises a cylindrical portion 174.
8. The surgical targeting system 156 of claim 7 wherein said drape 164 comprises an end portion 176 connected to and closing one end of said cylindrical portion 174, said end portion being hemispherical.
9. The surgical targeting system 189 of claim 1 wherein said drape 196 is conical.
10. The surgical targeting system 189 of claim 9 wherein said indicia 214 comprises a system of polar coordinates having a center coinciding with an apex of said drape 196.
11. A system 156 for providing a sterile field around an elongate body 159 comprising:
 - an antimicrobial drape 164 having a cylindrical portion 174 and an end portion 176 connected to and closing one end of said cylindrical portion 174, said end portion 176 being hemispherical, said drape 164 having sufficient flexibility to conform to at least a portion of an outer surface 161 of the elongate body 159, said drape 164 being puncturable to provide access to the outer surface 161 of the body 159; and
 - means for fixing said drape 164 to the outer surface 161 of the body 159, said drape 164 and fixing means being sterile to provide a sterile field around the outer surface of the body 159 accessed by puncturing of said drape 164.

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12. The sterile field system 156 of claim 11 wherein said drape 164 comprises plastic impregnated with iodophor.

5 13. The sterile field system 156 of claim 11 wherein said fixing means comprises adhesive 181 applied to the surface of said drape 164 which contacts the outer surface 161 of the body 159.

10 14. The sterile field system 156 of claim 11 wherein said fixing means comprises forming said drape 164 of expandable material and sizing said drape 164 to have an internal volume which is less than the volume of the elongate body 159 enabling said drape 164 to be shrink-fitted onto the body 159.

15 15. The sterile field system 156 of claim 11 wherein said drape 164 is transparent to imaging radiation,

20 said sterile field system 156 further comprising an indicia 179 affixed to a portion of said drape 164, said indicia 179 being opaque to the imaging radiation such that a radiographic image of the body 183 resulting from passage of the image radiation through the body 159 includes an indicia image 182 corresponding to said indicia 179,

25 said fixing means fixing said indicia 179 relative to the outer surface 161 such that said indicia 179 provides a reference on said body 159 for correlating portions of the body 159 to the radiographic image thereof 183.

16. A system 189 for providing a sterile field around a conical body 191 comprising:

a conical antimicrobial drape 196 having sufficient flexibility to conform to at least a portion of an outer surface 194 of the conical body

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191, said drape 196 being puncturable to provide access to the outer surface 194 of the body 191; and

means for fixing said drape 196 to the outer surface 194 of the body 191, said drape 196 and fixing means being sterile to provide a sterile field around the outer surface 194 of the body 191 accessed by puncturing of said drape 196.

17. The sterile field system 189 of claim 16 wherein said drape 196 comprises plastic impregnated with iodophor.

18. The sterile field system 189 of claim 16 wherein said fixing means comprises adhesive 216 applied to the surface 201 of said drape 196 which contacts the outer surface 194 of the body 191.

19. The sterile field system 189 of claim 16 wherein said drape 196 has a radial cutout 206 having a base 209 which coincides with a peripheral edge 204 of said drape 196.

20. The sterile field system 189 of claim 16 wherein said drape 196 is transparent to imaging radiation,

said sterile field system 189 further comprising an indicia 214 affixed to a portion of said drape 196, said indicia 214 being opaque to the imaging radiation such that a radiographic image of the body 223 resulting from passage of the image radiation through the body 191 includes an indicia image 222 corresponding to said indicia 214,

said fixing means fixing said indicia 214 relative to the outer surface 194 such that said indicia 214 provides a reference on said body 191 for correlating portions of the body 191 to the radiographic image thereof 223.

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21. The sterile field system of claim 20 wherein said indicia 214 comprises a system of polar coordinates having a center coinciding with the apex of said drape 196.

5 22. A method for correlating a selected portion of a body 4 to a radiographic image of the body 3 for treatment of the body 4, said method comprising the steps of:

applying a radio-transparent drape 9 having radio-opaque indicia 21 to the body 4;

10 fixing said drape 9 and indicia 21 to the body 4;

directing imaging radiation through said drape 9 and indicia 21 such that a radiographic image of said body 3 and indicia 2 is formed on a medium;

15 referencing on the radiographic image the selected portion of the body 3 relative to the indicia 2;

locating the selected portion of the body 4 by referencing the body 4 relative to the indicia 21 on the drape 9 in a manner corresponding to said referencing of the radiographic image; and

puncturing the drape 9 to access the body 4 for treatment thereof.

20 23. The method of claim 22 and further comprising the steps of:

referencing a second selected portion of the body 3 on the radiographic image relative to the indicia 2 on the radiographic image; and

25 locating the second selected portion of the body 4 by referencing the body 4 relative to the indicia 21 on the drape 9 in a manner corresponding to said referencing of the second selected portion of the radiographic image.

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24. The method of claim 22 wherein said applying step comprises placing the drape 9 on the body 4 such that the body 4 is disposed between at least two portions of the indicia 21, said placing of the drape 9 further providing that each said portion of the indicia 21 is contained in a separate plane which is in parallel separation to the other plane.

25. The method of claim 22

wherein said applying step comprises placing the drape 9 on the body 4 such that the body 4 is disposed between at least two portions of the indicia 21,

wherein said referencing step comprises identifying on the radiographic image the portions of the indicia 2 intersected by an axis coinciding with a selected direction through the body 4,

wherein said locating step comprises locating the selected direction through the body 4 by referencing the body 4 relative to the portions of the indicia 21 on the drape 9 identified in said referencing of the radiographic image;

wherein said puncturing step comprises puncturing the drape 9 to access the body 4 adjacent to at least one of the portions of the indicia 21.

26. A method for correlating a selected portion of a body 4 to a radiographic image of the body 3 for treatment of the body 4, said method comprising the steps of:

applying a radio-transparent drape 9 having radio-opaque indicia 21 to the body 4;

fixing said drape 9 and indicia 21 to the body 4;

directing imaging radiation through said drape 9 such that a radiographic image of said body 3 and indicia 2 is formed on a medium;

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referencing on the radiographic image the selected portion of the body 3 relative to the indicia 2;

locating the selected portion of the body 4 by referencing the body 4 relative to the indicia 21 on the drape 9 in a manner corresponding to said referencing of the radiographic image; and

surgically operating on the body 4 contemporaneously with said locating step.

27. A method for correlating a selected portion of a body 4 to a radiographic image of the body 3 for treatment of the body 4, said method comprising the steps of:

applying a radio-transparent drape 9 having radio-opaque indicia 21 to the body 4 such that portions of the drape 9 define at least two surfaces inclined relative to one another;

fixing said drape 9 and indicia 21 to the body 4;

directing imaging radiation through said drape 9 such that a radiographic image of said body 3 and indicia 2 is formed on a medium;

referencing on the radiographic image the selected portion of the body 3 relative to the indicia 2, said referencing step further comprising identifying on the radiographic image respective indicia 2 on the inclined two surfaces, said respective indicia 2 being intersected by an axis coinciding with a selected direction through the body 4, said referencing step further comprising identifying on the radiographic image indicia 2 on one of the inclined two surfaces coinciding with the depth of the selected direction relative to the other of the inclined two surfaces; and

locating the selected portion of the body 4 by referencing the body 4 relative to the indicia 21 on the drape 9 in a manner corresponding to said referencing step of the radiographic image, said locating step comprising identifying the selected direction and depth through the body

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4 by referencing the body 4 relative to the indicia 21 on the drape 9 identified in said referencing step of the radiographic image.

28. A method for correlating the buttock 76 with the femoral canal of the femur of a body 126, said method comprising the steps of:

applying a radio-transparent drape 81, 131 having at least two indicia 99, 144 each comprising a radio-opaque longitudinal axis to the leg of the body 126 such that a first portion of the drape 81, 131 extends in an anterior-posterior plane relative to the body 76, 126, said applying step further providing for a second portion of the drape 81, 131 to extend laterally relative to the body 76, 126, said applying step providing further for each of the indicia 99, 144, to be contained in respective first and second portions of the drape 81, 131, said applying step providing further for each of the indicia 99, 144, to be longitudinally and centrally aligned relative to the leg 126;

directing imaging radiation through said drape 81, 131, such that a radiographic image of said body 109, 111, 114, 116, 119, 121, 148, 149, and indicia 108, 147 is formed on a medium;

comparing, by viewing the radiographic image, the relative positions of each of the indicia 108, 147 relative to the longitudinal axis of the femoral canal;

translating the drape 81, 131, as required, relative to the leg 126 such that one of the indicia 99, 144 is contained in an anterior-posterior plane which coincides with the longitudinal axis of the femoral canal, and such that the other of the indicia 99, 144 is contained in a lateral plane which coincides with the longitudinal axis of the femoral canal; and

locating the intersection of the indicia 99 on the buttock 76, the intersection of the indicia 99 defining a start point for a reference axis which, when intersecting said start point and parallel to the indicia 99,

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coincides with the longitudinal axis of the femoral canal.

29. A method as set forth in claim 28 and further comprising the steps of:

positioning a longitudinal nail relative to the leg 126 such that a
pointed end of the nail is adjacent to the start point on the buttock 76;

orienting the nail relative to the leg 126 such that the longitudinal
axis of the nail coincides with the reference axis;

inserting the nail through the tissue of the leg 126 such that the
longitudinal axis of the nail coincides with the reference axis, said

inserting step being initiated by puncturing the outer surface of the leg
126 at the start point with the pointed end of the nail;

inserting the nail further through the tissue 126 such that the
longitudinal axis of the nail continues to coincide with the reference axis,
and such that the pointed end of the nail punctures the proximal end of
the femoral canal; and

inserting the nail further into the femoral canal such that the
longitudinal axis of the nail continues to coincide with the reference axis.